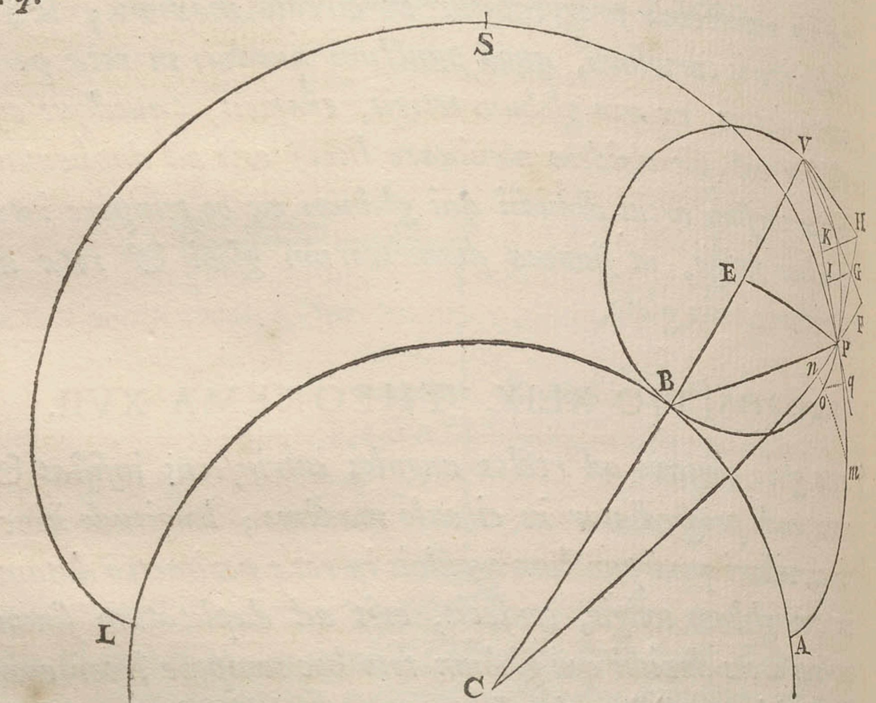
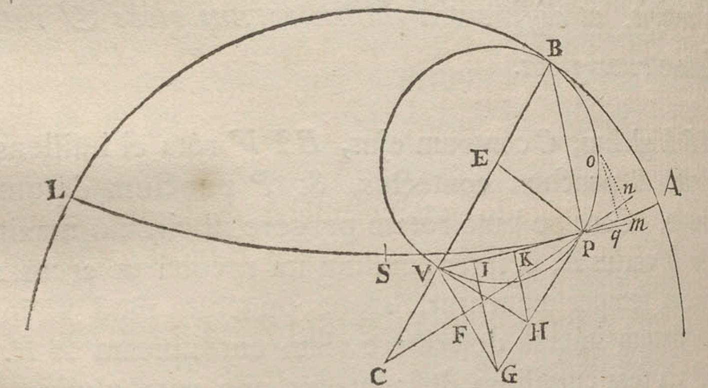
ad *VP* demittantur normales *GI*, *HK*. Centro item *C* & intervallo quovis deſcribatur circulus *nom* ſecans rectam *CP* in *n*, rotæ perimetrum *BP* in *o*, & viam curvilineam *AP* in *m*; centroque *V* & intervallo *Vo* deſcribatur circulus ſecans *VP* productam in *q*.





Quoniam rota eundo ſemper revolvitur circa punctum contactus *B*, manifeſtum eſt quod recta *BP* perpendicularis eſt ad lineam illam curvam *AP* quam rotæ punctum *P* deſcribit, atque ideo quod recta *VP* tanget hanc curvam in puncto *P*. Circuli *nom* radius ſenſim auctus vel diminutus æquetur tandem diſtantiæ *CP*; &, ob

ob ſimilitudinem figuræ evaneſcentis *Pnomq* & figuræ *PFGVI*, ratio ultima lineolarum evaneſcentium *Pm*, *Pn*, *Po*, *Pq*, id eſt, ratio mutationum momentanearum curvæ *AP*, rectæ *CP*, arcus circularis *BP*, ac rectæ *VP*, eadem erit quæ linearum *PV*, *PF*, *PG*, *PI* reſpective. Cum autem *VF* ad *CF* & *VH* ad *CV* perpendiculares ſint, angulique *HVG*, *VCF* propterea æquales; & angulus *VHG* (ob angulos quadrilateri *HVEP* ad *V* & *P* rectos) angulo *CEP* æqualis eſt, ſimilia erunt triangula *VHG*, *CEP*; & inde fiet ut *EP* ad *CE* ita *HG* ad *HV* ſeu *HP* & ita *KI* ad *KP*, & compoſite vel diviſim ut *CB* ad *CE* ita *PI* ad *PK*, & duplicatis conſequentibus ut *CB* ad 2 *CE* ita *PI* ad *PV*, atque ita *Pq* ad *Pm*. Eſt igitur decrementum lineæ *VP*, id eſt, incrementum lineæ *BV*—*VP* ad incrementum lineæ curvæ *AP* in data ratione *CB* ad 2 *CE*, & propterea (per corol. lem. IV.) longitudines *BV*—*VP* & *AP*, incrementis illis genitæ, ſunt in eadem ratione. Sed, exiſtente *BV* radio, eſt *VP* co-ſinus anguli *BVP* ſeu $\frac{1}{2}$ *BEP*, ideoque *BV*—*VP* ſinus verſus eſt ejuſdem anguli; & propterea in hac rota, cujus radius eſt $\frac{1}{2}$ *BV*, erit *BV*—*VP* duplus ſinus verſus arcus $\frac{1}{2}$ *BP*. Ergo *AP* eſt ad duplum ſinum verſum arcus $\frac{1}{2}$ *BP* ut 2 *CE* ad *CB*. *Q. E. D.*

Lineam autem *AP* in propoſitione priore cycloidem extra globum, alteram in poſteriore cycloidem intra globum diſtinctionis gratia nominabimus.

Corol. 1. Hinc ſi deſcribatur cyclois integra *ASL* & biſecetur ea in *S*, erit longitudo partis *PS* ad longitudinem *VP* (quæ duplus eſt ſinus anguli *VBP*, exiſtente *EB* radio) ut 2 *CE* ad *CB*, atque ideo in ratione data.

Corol. 2. Et longitudo ſemiperimetri cycloidis *AS* æquabitur lineæ rectæ, quæ eſt ad rotæ diametrum *BV* ut 2 *CE* ad *CB*.

PROPOSITIO L. PROBLEMA XXXIII.

Facere ut corpus pendulum oſcilletur in cycloide data.

Intra globum *QVS*, centro *C* deſcriptum, detur cyclois *QRS* biſecta in *R* & punctis ſuis extremis *Q* & *S* ſuperficiei globi hinc inde occurrens. Agatur *CR* biſecans arcum *QS* in *O*, & producatur ea ad *A*, ut ſit *CA* ad *CO* ut *CO* ad *CR*. Centro *C* inter-

 vallo